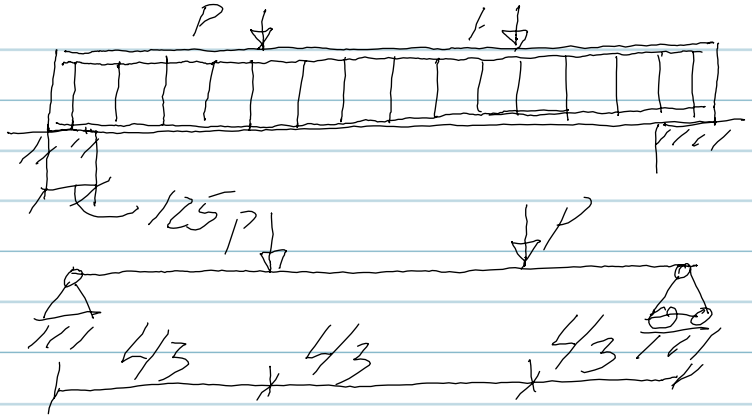
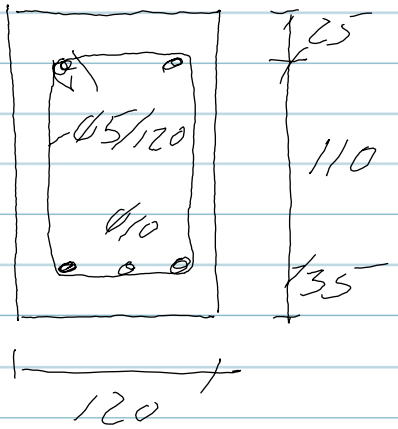
DTU - Betonkonstruktioner





$f_{cd} = 20/1{,}45 = 13{,}8\ MPa$

$f_{yd} = 550/1{,}2 = 458\ MPa$

$V_{Rd} = \min(V_{Rd,w};\ V_{Rd,s};\ V_{Rd,c})$

Valg $\cot\theta = 2{,}5$

$$V_{Rd,w} = \frac{A_{sw}}{s} \cdot z \cdot f_{yd} \cdot \cot\theta = \frac{2\pi\left(\frac{5}{2}\right)^2}{120} \cdot 107{,}4 \cdot 458 \cdot 2{,}5$$

$$= 30{,}2 \cdot 10^3\ N = \underline{30{,}2\ kN}$$

$$z = d - \tfrac{1}{2}y = 135 - \tfrac{1}{2} \cdot 65{,}24 = 107{,}4\ mm$$

$$V_{Rd,c} = \nu_1 \cdot f_{cd} \cdot b_w \cdot z \cdot \frac{\cot\theta}{1+\cot\theta^2}$$

$$= 0{,}6 \cdot 13{,}8 \cdot 120 \cdot 107{,}4 \cdot 2{,}5/(1+2{,}5^2)$$

$$= 23{,}8 \cdot 10^3\ N = \underline{23{,}8\ kN}$$

$$\nu_1 = 0{,}7 - f_{ck}/200 = 0{,}7 - 20/200 = 0{,}6$$

$$V_{Rd,s} = \frac{2 \cdot \sigma_{s,max} \cdot A_s}{\cot\theta} = \frac{2 \cdot 162 \cdot 3\pi\left(\frac{10}{2}\right)^2}{2{,}5} = \underline{161\ kN}$$

$$l_b = 56 \cdot \phi = 56 \cdot 10 = 560\ mm \quad > a = 125\ mm$$

$$\sigma_{s,max} = \frac{a}{l_b} f_{yd} = \frac{125}{560} \cdot 458 = 102\ MPa$$

$$\Rightarrow V_{Rd} = \underline{161\ kN} \quad (\text{Forankringen!})$$